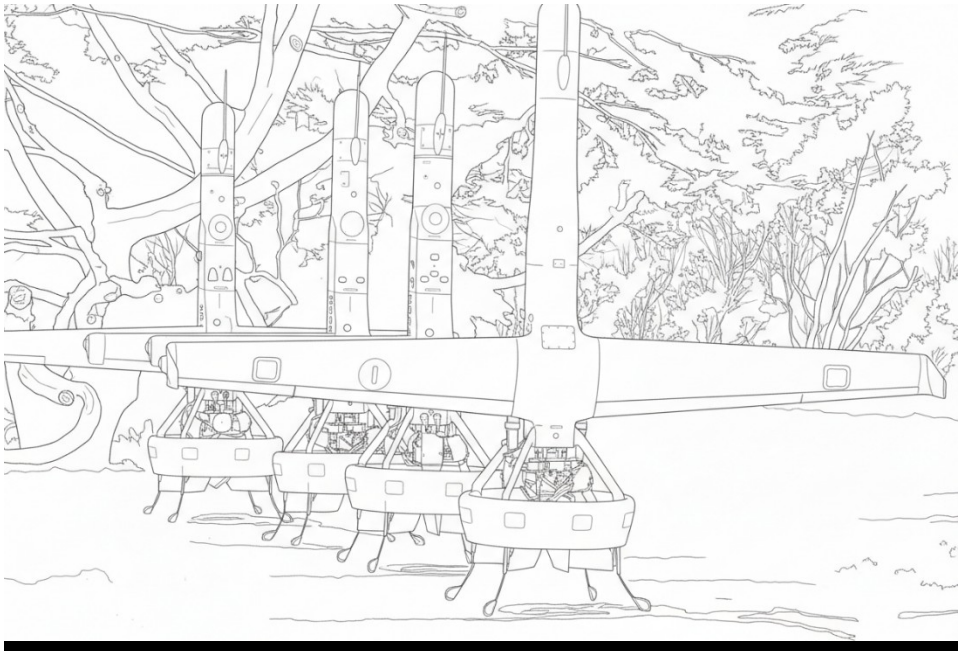
Shield AI MQ-35A V-BAT



IDENTITY & DESIGNATION

Official Designation: MQ-35A V-BAT

Manufacturer: Shield AI, Inc. (San Diego, CA, USA); originally Martin UAV, acquired by Shield AI 2021

Country of Origin: United States

Year Introduced: 2016 (Martin UAV); 2021 (Shield AI acquisition); 2024 (Hivemind integration / Ukraine deployment)

NATO/Allied Designation: N/A — US-origin military program

CLASSIFICATION

Domain: Air

Category: Military / ISR & Targeting

Sub-Category: Group 3 VTOL Ducted-Fan UAV (delivering Group 4/5 capabilities)

Terminal Mode: Recoverable

Expendable: No

PHYSICAL SPECIFICATIONS

Weight (MGTOW): 161 lbs (73 kg)

Length: 12.5 ft (3.8 m)

Wingspan: 12.5 ft (3.8 m)

Height: 9.6 ft (2.9 m)

Payload Capacity: 40 lbs (18.1 kg) max; 600W payload power; three open payload slots (SOCOM Modular Payload Standard)

Airframe Material: Composite construction with ducted fan shroud

Landing Zone: 15 ft × 15 ft (4.6 m × 4.6 m) — ship decks, rooftops, austere sites

PROPULSION & PERFORMANCE

Propulsion Type: Single ducted-fan, heavy-fuel engine (JP-5 compatible)

Fuel: JP-5 (standard maritime/naval aviation fuel)

Max Endurance: 13+ hours (with EO/IR payload)

Max Speed: 56 mph (90 km/h / 49 kn)

Service Ceiling: 18,000 ft (5,500 m)

Max Range (MPU5 Radio): 81 mi (130 km)

Max Range (C-Band Radio): 112 mi (180 km)

Max Range (SATCOM): Beyond line of sight (BLOS) — global C2

Wind Resistance: Max winds 25 kn launch/land; moving ship speed 10 kn

VTOL Capability: Fully unassisted vertical launch and landing — no runway, catapult, net, or human assistance required

GUIDANCE, NAVIGATION & CONTROL

Control Link: MPU5 radio, C-Band radio, SATCOM (BLOS); STANAG compliant

Navigation: GPS/INS + Hivemind visual odometry (GPS-independent)

Autonomy Software: Shield AI Hivemind AI Pilot — combat-proven AI-powered perception, cognition, and autonomous mission execution

GPS-Denied Capability: YES — Full mission execution without GPS via visual odometry; combat-proven in Ukraine against Russian and Ukrainian EW

Comms-Denied Capability: YES — Continues mission autonomously when all datalinks severed; demonstrated in Black Sea operations

Autonomy Level: High autonomous — AI-piloted ISR/targeting with autonomous navigation, target detection/tracking, and return-to-base

Swarm Capability: YES — V-BAT Teams: single operator commands multiple aircraft covering 30,000 sq mi via Hivemind

Operator Skill: Moderate — 2-person team for deployment; fits in pickup truck or UH-60

Man-in-Loop Required: Yes (weapons authorization); No (navigation, ISR, autonomous flight)

Fiber-Optic Option: No — unnecessary; Hivemind provides comms-independent operation

SENSORS & PAYLOADS

Primary Sensor: Gyro-stabilized EO/IR gimbals with continuous zoom, integrated GPS/INS, advanced video processing

ViDAR: Passive wide-area motion imagery — 3,140 NM^2/hr coverage rate (2.5x nearest competitor); AI-powered automatic target detection and tracking

SAR: Synthetic aperture radar integration

EW Payloads: Electronic warfare payload integration

Targeting: Laser target designator, laser rangefinder

Kinetic Munitions: In development — precision strike capabilities with customizable options

Other Payloads: AIS, GNSS anti-jam, M-code GNSS, aircraft transponder

Payload Architecture: Open — SOCOM Modular Payload Standard enables rapid third-party integration

COUNTERMEASURE VULNERABILITY PROFILE

RF Jamming: LOW — Hivemind visual odometry enables full mission completion without RF link; combat-proven against 7+ simultaneous jammers in Ukraine; 60-mile test mission through jammed airspace

GPS Spoofing: LOW — Does not rely on GPS; visual odometry navigation continues unaffected; Hivemind designed for GPS-denied operations from inception

EMI/EMC Attack: MODERATE — Military-grade construction with some hardening; however, internal electronics remain vulnerable to high-power directed EMI; ducted fan shroud provides partial Faraday shielding

Microwave Attack: MODERATE — Better protected than consumer drones due to military construction; ducted-fan housing provides some shielding; but unhardened commercial electronics components remain susceptible to high-power microwave effects

Laser DEW: MODERATE — Composite airframe more resistant than consumer plastic; small cross-section; but 56 mph cruise speed and ISR loiter profile make sustained dwell achievable

Kinetic Intercept: MODERATE — Small radar/acoustic signature; ducted fan quieter than exposed rotors; but limited speed (56 mph) and predictable ISR orbits create engagement windows

Net / Physical Capture: LOW — Ducted fan design resists rotor fouling; 161 lbs too heavy for most net systems; transition between hover and forward flight creates variable intercept geometry

Cyber / Hack: LOW — Military encrypted communications; Hivemind operates autonomously without external link; no equivalent to DJI AeroScope tracking

Active Camouflage Defeat: N/A — Primarily instrument-guided; operator at standoff distance

Overall Vulnerability Rating: LOW-MODERATE — Hivemind autonomy defeats the two most common countermeasure approaches (RF jamming and GPS spoofing); vulnerability concentrated in physical/energy weapons that require detection and tracking of a small, quiet target

CRUISE MISSILE CONVERGENCE NOTES

The V-BAT represents a critical midpoint on the cruise missile convergence spectrum. Its Hivemind visual odometry navigation is functionally equivalent to cruise missile terrain-contour-matching (TERCOM) and digital scene-matching area correlation (DSMAC) — the aircraft navigates by recognizing what it sees, not by following GPS waypoints. This makes it immune to the GPS jamming and spoofing that defeats consumer drones, achieving the same EW resistance that made cruise missiles effective in the first place.

The convergence goes further: V-BAT operates without any communications link when jammed, completing autonomous missions and returning with intelligence — a capability previously exclusive to cruise missiles and their fire-and-forget guidance. The key difference is recoverability: V-BAT returns with its payload of intelligence, where a cruise missile delivers its warhead. With kinetic munitions in development, this distinction narrows further.

V-BAT Teams — single-operator control of multiple autonomous aircraft covering 30,000 sq mi — mirrors the distributed salvo concept of cruise missile warfare. At mid-six-figure cost per unit, V-BAT achieves cruise-missile-class EW resistance and autonomous operation at a fraction of Tomahawk’s $2M+ price point, in a reusable package with 13+ hour endurance. This is capability compression: a Group 3 airframe delivering what previously required Group 4/5 platforms or expendable cruise missiles.

For countermeasure planners, V-BAT invalidates the two cheapest and most common C-UAS approaches: RF jamming and GPS spoofing. Effective countermeasures must shift to physical intercept, directed energy, or cyber exploitation of the Hivemind software itself — all of which are more expensive and complex than jamming.

OPERATIONAL HISTORY

Combat-proven platform with extensive operational deployment across multiple theaters. In Ukraine, V-BATs have completed 170+ combat sorties with the Unmanned Systems Forces since mid-2024, with 16 aircraft deployed and a Shield AI Kyiv office of 30 operators supporting mission planning and monitoring. Notable Ukraine operations include:

• Located a Russian SA-11 Buk-M1 SAM system 80 km into Russian-held territory south of Zaporizhzhia despite full-spectrum electronic warfare, leading to a HIMARS precision strike destroying the target.

• Black Sea reconnaissance mission where GPS, communications, and command links were all simultaneously severed: aircraft completed the mission autonomously and returned with intelligence on Russian MiG-31s armed with Kinzhal hypersonic missiles.

• Identified hundreds of targets including air defense systems, headquarters, and drone control nodes.

• Withstood seven simultaneous jammers in a two-day EW resistance test; completed a 60-mile test mission through fully jammed airspace.

Described by Shield AI as the “only long-endurance ISR and strike platform to penetrate both Ukrainian and Russian GPS and comms jammers.”

Deployed on nearly every class of US Navy ship and with all seven Marine Expeditionary Units (MEUs). US Coast Guard awarded $198M contract (July 2024) for maritime ISR services. Japan MSDF selected V-BAT as first-ever ship-based ISR platform (January 2025). Indian Army emergency procurement (January 2026, $35M). Netherlands Royal Navy and Marine Corps (12 units, July 2025). Brazil VSK Tactical (February 2022). EU Frontex border security operations. Competing in US Army FTUAS Increment 2 to replace RQ-7B Shadow (teamed with Northrop Grumman).

Safety note: In April 2024, a V-BAT partially severed three fingers of a US Navy sailor assisting with landing. Shield AI subsequently redesigned for fully unassisted launch and landing, eliminating human contact requirement.

Unit cost: Mid-six figures. Production scaling via JSW Defense joint venture in India ($90M investment, factory at Maheshwaram near Hyderabad, construction began December 2025). Palantir Warp Speed software deployed for manufacturing optimization (December 2024).

SOURCES & CROSS-REFERENCES

Manufacturer: https://shield.ai/v-bat/

Wikipedia: https://en.wikipedia.org/wiki/Shield_AI_MQ-35_V-BAT

Defense Security Monitor: BRIEFER: Shield AI V-BAT

Army Recognition: Shield AI unveils V-BAT block upgrade, April 2025

Cross-Ref: See also: Shield AI X-BAT (autonomous fighter evolution of Hivemind platform); Anduril Ghost X (competing Group 3 ISR); RQ-7B Shadow (V-BAT replacement target in FTUAS); Bayraktar TB2 (comparable ISR/strike role, different architecture)